Claims

What is claimed is:

1. A power splitter comprising:

a) a substrate having a plurality of layers;

b) a resistor formed on one of the layers;

c) a capacitor formed between two of the layers;

d) a transformer attached to the substrate and electrically connected to the resistor and capacitor, the transformer providing impedance matching and dividing; and

e) a plurality of vias extending between the layers for providing electrical connections between the resistor, capacitor and transformer.

2. The power splitter according to claim 1 wherein the substrate is formed from layers of low temperature co-fired ceramic.

3. The power splitter according to claim 1 wherein the transformer has a binocular core and a plurality of windings.

4. The power splitter according to claim 3 wherein the transformer is attached to the substrate using an epoxy.

5. The power splitter according to claim 4 wherein a plurality of terminals are located on an upper layer.

6. The power splitter according to claim 5 wherein the windings are electrically connected to the terminals by a plurality of welds.

7. The power splitter according to claim 1 wherein the substrate is connected to a printed circuit board by a reflowed solder paste attached to a conductive pad on a bottom layer.

8. The power splitter according to claim 1 wherein the capacitor has one electrode formed on one layer and another electrode formed on another layer.

9. The power splitter according to claim 1 wherein at least two of the power splitters are cascaded.

10. The power splitter according to claim 9 wherein two power splitters are cascaded to form a 4-way power splitter.

11. The power splitter according to claim 9 wherein four power splitters are cascaded to form a 8-way power splitter.

12. A power splitter for providing impedance matching and dividing, the power splitter having an input port and a first and second output port, the power splitter comprising:

a) a multi-layered low temperature co-fired ceramic substrate, the substrate having a top surface and a bottom surface;

b) a plurality of terminals located on the top surface;

c) a transformer attached to the upper surface and electrically connected to the terminals; and

d) a plurality of vias extending through the substrate for providing an electrical connection between the terminals and the bottom surface.

13. The power splitter according to claim 12 wherein a resistor is formed on the top surface and is electrically connected between the first and second output ports.

14. The power splitter according to claim 12 wherein a capacitor is formed on the substrate and is electrically connected between the transformer and a ground connection.

15. The power splitter according to claim 12 wherein the transformer has a binocular core and a plurality of windings.

16. The power splitter according to claim 12 wherein the transformer is attached to the substrate using an epoxy.

17. The power splitter according to claim 15 wherein the windings are electrically connected to the terminals by a plurality of welds.

18. The power splitter according to claim 12 wherein the substrate is connected to a printed circuit board by a reflowed solder paste attached to a conductive pad on the bottom surface.

19. The power splitter according to claim 12 wherein the capacitor is formed by a pair of electrodes having a layer of the low temperature co-fired ceramic therebetween, the electrodes each connected to a via.

20. The power splitter according to claim 12 wherein at least two of the power splitters are cascaded into a higher order splitter.

21. The power splitter according to claim 20 wherein three power splitters are cascaded to form a 4-way power splitter.

22. The power splitter according to claim 20 wherein seven power splitters are cascaded to form a 8-way power splitter.

23. A method of manufacturing a power splitter comprising the steps of:

a) providing a plurality of layers of low temperature co-fired ceramic;

b) punching a plurality of holes in the low temperature co-fired ceramic layers;

c) filling the holes with a conductive material to form a plurality of vias;

d) screening a plurality of circuit features onto the layers;

e) stacking the layers;

f) firing the stacked layers in an oven to form a unitary substrate; and

g) attaching a transformer to the substrate.

24. The method according to claim 23 wherein the circuit features are chosen from the group consisting of:

a) resistors;

b) capacitors;

c) circuit lines;

d) terminals; and

e) resistor overglaze.

25. The method according to claim 23 wherein the transformer has a plurality of wire windings, the wire windings being welded to the terminals.

26. The method according to claim 23 wherein the transformer is attached to the substrate using an adhesive.

27. The method according to claim 26 wherein the transformer has a binocular core, the windings wound around the core so as to form an input port and a pair of output ports.

28. The method according to claim 23 wherein the substrate is attached to a printed circuit board, further comprising the steps of:

a) screening a solder paste onto a bottom surface conductive pad;

b) placing the substrate onto the printed circuit board; and

c) reflowing the solder paste such that the substrate is attached to the printed circuit board.